

was so situated that it was exposed only to the morning sun. (The room was thoroughly sprayed from a hydrant both morning and evening.) The explosions occurred after four in the afternoon and immediately followed a spraying of the plants. Within one to three minutes the plants looked as if smoke was coming from them. This was so conspicuous as to be noticed from any part of the room. A closer view showed that the smoke-like substance was coming in little puffs from the surface of the liverworts, not unlike a tiny battery. The material seemed most abundant from two to four inches above the plants. The writer and Professor Mottier both held slides over the plants and caught the spermatozoids in great numbers. The conspicuous discharges lasted only about five minutes and in four or five minutes more none could be noticed.

The above observations seem to indicate that *moisture alone* may be the inciting cause of the explosion in *Conocephalum conicum*.

DEWITT CLINTON HIGH SCHOOL, NEW YORK CITY,  
March 16, 1903.

## PROCEEDINGS OF THE CLUB

WEDNESDAY, FEBRUARY 25, 1903

The Club met at the usual hour at the New York Botanical Garden, with President Brown in the chair. There were 30 persons present.

The resignation of Professor H. F. Osborn, of New York City, was accepted.

The president announced the following standing committees for 1903:

Committee on Finance: H. H. Rusby, J. I. Kane, C. F. Cox.

Committee on Admissions: Cornelius Van Brunt, Delia W. Marble, J. K. Small.

Committee on Local Flora: Phanerogamia — N. L. Britton, E. P. Bicknell, H. H. Rusby, Fanny A. Mulford. Cryptogamia — L. M. Underwood, M. A. Howe, Elizabeth G. Britton.

Committee on Program: N. L. Britton, M. A. Howe, L. M. Underwood.

The membership of the Field Committee will be announced later.

The first paper on the scientific program was by Dr. Hollick on "Fossil Figs, with Description of a new Species from the Dakota Group of Kansas." In the author's absence, it was read by Dr. Howe. The paper is published in full in the February number of the *Bulletin*.

The second paper was by Mrs. Alice R. Northrop on "The Flora of Nashawena Island, Massachusetts."

This is one of the Elizabeth Islands lying southwest of Woods Holl. It is about three miles long by one mile wide. It is owned privately and was formerly largely in cultivation, but is now used as a sheep pasture, and is much grown up with bushy thickets. The soil is glacial drift, being part of a terminal moraine, like Martha's Vineyard, Nantucket, etc. The surface is quite uneven, with many knobs and undulations and with numerous small ponds in the depressions. The south shore is steep and abrupt, rising to an elevation of 70 to 80 feet and gradually sloping to the northward. The greatest elevation at any point is 120 feet.

The forest areas are confined to the depressions. The tops of the trees are much flattened owing to the strong winds, and none of them reaches above the level of the protecting hills. The largest trees are not over 30 feet high and 12-15 inches in diameter. While the trees are stunted, the shrubs and bushes growing in their shelter are often unusually large and vigorous.

The plant-covering of the island can be conveniently classed in four groups. First, the halophytes along the shore. Second, the hydrophytes occupying the numerous ponds and marshy places. Third, the forest areas, and fourth, the plants of the open downs.

The halophytes include the usual beach plants of the region. Two of special interest were a *Teucrium* and a *Plantago*, both of which have been recently described as new by Mr. Bicknell.

The hydrophytic vegetation of the ponds and their border was

very rich and included a large number of species, but none that was particularly noteworthy.

The prevailing trees of the forest areas are red maple and the black oak, *Quercus velutina*. *Q. alba*, *Q. Marylandica*, beech, sour gum (*Nyssa*), sassafras and holly (*Ilex opaca*) also occur. The more abundant shrubs are pepper bush, button bush, *Amelanchier*, *Kalmia angustifolia*, *Vaccinium corymbosum*, sweet gale, choke cherry, etc. *Smilax rotundifolia* is very abundant. Orchids were abundant, as many as ten species being found. On the drier hills, *Gaylussacia resinosa* was abundant, but it produces little fruit owing to the attack of a fungus, *Exobasidium*. In the swamps, *Osmunda cinnamomea*, *Woodwardia arcolata* and *W. Virginica* were very abundant and luxuriant.

In all, 335 species of flowering plants were collected on the island, without including all of the grasses and sedges.

After an interesting discussion the Club adjourned.

F. S. EARLE,  
Recording Secretary.

WEDNESDAY, March 10, 1903

The Club met at the College of Pharmacy at 8 P. M.; Professor Lloyd in the chair; 22 persons present.

The first paper on the scientific program was by Miss Rosina J. Rennert, under the title of "Notes on the Anatomy and Physiology of *Oxypolis filiformis*."

This investigation was carried on under the direction of Dr. MacDougal, of the New York Botanical Garden. *Oxypolis filiformis* is an umbellifer growing on the margins of ponds and swamps in southern United States and in Europe. Its leaves are reduced to awl-shaped septate phyllodes, giving the plant a rush-like appearance. In a paper on septate leaves in dicotyledons, Briquet describes the anatomy of the phyllode minutely. He found six tissues in the leaf, epidermis, hypoderm, chlorenchyma, fibro-vascular bundles, endoderm, and a loose stellate-celled tissue occupying the central core. He regards some of these characters as strongly hydrophytic and others as xerophytic and explains the possession of characters suited to such

opposed conditions as an adaptation to the changes obtaining in the swamp habitat. In the early spring and summer moist conditions prevail. In the late summer and fall, the swamps present conditions conducive to transpiration and thus the xerophytic features of the plant come into play.

Plants from Georgia in the herbarium of the New York Botanical Garden were found to possess in all cases minute depressions or pits along the phyllode. Beneath the floor of the pit is a smaller-celled compact secretory tissue containing resin and serving as a resin gland.

By submerging some plants and growing others in a saturated atmosphere, a marked change in the phyllodes produced after the change in the conditions was inaugurated became evident. The phyllodes were hollow, absolutely terete, and exhibited no trace of resin glands. Microscopic examination revealed an entire absence of cuticle, hypoderm, secretory tissue and central stellate tissue, a reduction of the number of stomata, of the xylem in the bundles, of the chlorenchyma, and of the endoderm. These changes are such as tend toward a suppression of xerophytic features or serve as means of adaptation to moist conditions and therefore hydrophytic in their nature. The xerophytic nature of the normal form is so plainly indicated by the thick cuticle, the hypoderm and the possession of resin glands, that it seems reasonable to supersede Briquet's explanation of the structure of the plant by one less cumbersome. This is, that in the modified plant we see the hydrophytic form but that normally *Oxypolis filiformis* is never a hydrophyte but rather a swamp xerophyte.

The paper was discussed by Dr. MacDougal, Dr. Barnhart and Professor Lloyd, Dr. MacDougal remarking upon *Oxypolis filiformis* as a fine example of plasticity in plants.

The second paper was by Mr. Edward W. Berry and was entitled, "Notes on the Matawan Formation and its Flora."

The Matawan formation was briefly characterized and its areal and vertical range discussed. It consists of clays and sands closely related to those of the Raritan formation, and extends from Raritan Bay in Monmouth County, New Jersey, southwest-

erly to the Potomac River, becoming gradually narrower and thinner to the southward. The formation is of mid-Cretaceous age and marks the transition period from the underlying freshwater Raritan deposits to those of the overlying marine Monmouth formation. The only locality where plant remains have been found is on Raritan Bay near Keyport, where the formation makes a bluff some thirty feet high, fronting on the bay. Mr. Berry enumerated sixty-seven species of plants from this locality, which is commonly known as Cliffwood. The plants occur in the clay and furnish most beautiful, but evanescent specimens. New species were obtained in *Arisaema*, *Carpolithus*, *Aralia*, *Quercus*, *Sterculia*, *Celastrorphyllum*, *Salix*, *Eucalyptus* and *Nelumbo*. These will shortly be published in the *Bulletin of the New York Botanical Garden*. The flora is very closely related to that of the Raritan formation, and a marked feature is the entire absence of ferns, remains of which have not as yet been found, although they form over five per cent. in the underlying Raritan. Remarkable remains are those of *Moriconia cyclotoxon* D. & E., a widespread and beautiful member of the Cupressineae. The Matawan specimens of this differ in being about twice the size of any forms heretofore discovered. Among the most abundant remains are scales supposedly related to the Araucarian genus *Dammara*, and twigs and cones of *Sequoia*. Twigs of *Cunninghamites* are also abundant.

The flora shows a rather striking resemblance to that from the Atane beds of Greenland, the large-leaved *Aralia Raveniana* Heer from that formation reappearing in considerable numbers. Other points of resemblance are identical species of *Sequoia*, *Sapindus*, *Laurus*, *Andromeda*, *Moriconia*, *Aralia*, *Magnolia*, *Desvalquea*, etc. This Matawan flora is the latest known Cretaceous flora of the Atlantic coastal plain, all the overlying formations being marine. The paper was illustrated with drawings, photographs of the plant beds, and specimens.

Professor Lloyd called the attention of the Club to a simple form of auxanometer, consisting of a vertical lever, carrying the record, moved once an hour and so marking off equal intervals of growth, the movement being accomplished by an arm carried

on the minute-hand spindle of a cheap clock. This method obviates the use of a cylinder, which is difficult to arrange.

Adjournment followed.

MARSHALL A. HOWE,  
*Secretary pro tem.*

#### NEWS ITEMS

Dr. and Mrs. N. L. Britton returned to New York on April 3 from a collecting expedition to Cuba. Most of their three weeks on the island was spent in the vicinity of Matanzas.

The Connecticut Botanical Society's committee on the lower cryptogams has been constituted as follows: *Bryophyta*: Professor A. W. Evans, New Haven; *Algae*: Mr. Isaac Holden, Bridgeport; *Fungi*: Dr. G. P. Clinton, New Haven.

We learn from *Science* that Dr. Frederick DeForest Heald, now professor of biology in Parsons College, Iowa, has been elected adjunct professor of plant physiology and general bacteriology in the University of Nebraska.

Professors Volney M. Spalding, of the University of Michigan, and W. A. Setchell, of the University of California, have been granted a year's leave of absence by their respective institutions, and will devote this time largely to travels and botanical investigations in Europe.

Professor F. S. Earle, of the New York Botanical Garden, returned on April 2 from Cuba, where, in company with Professor L. M. Underwood and Mr. E. W. D. Holway, he has been making collections of fungi in the neighborhood of Santiago and Baracoa. Professor Underwood has returned to Jamaica to continue the explorations begun by him there in January.